

## DATA TRACKING AND TECHNICAL FACT SHEET

Permittee: Town of Manchester

### PERMIT, ADDRESS, AND FACILITY DATA

PERMIT #: CT0100293 APPLICATION #: 201100306 FACILITY ID. 077-001

<u>Mailing Address:</u> Street: 125 Spring Street, PO Box 191 City: Manchester ST: CT Zip: 06045 Contact Name: Mike Emond Phone No.: 860-647-3115	<u>Location Address:</u> Street: 120 Thrall Road City: Manchester ST: CT Zip: 06040 Contact Name: Mike Emond Phone No.: 860-647-3115 DMR Contact email address: memond@manchesterct.gov
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### PERMIT INFORMATION

DURATION 5 YEAR X 10 YEAR \_\_\_\_ 30 YEAR \_\_\_\_

TYPE New \_\_\_\_ Reissuance X Modification \_\_\_\_

CATEGORIZATION POINT (X) NON-POINT ( ) GIS #

NPDES (X) PRETREAT ( ) GROUND WATER (UIC) ( ) GROUND WATER (OTHER) ( )

NPDES MAJOR (MA) X

NPDES SIGNIFICANT MINOR or PRETREAT SIU (SI) \_\_\_\_

NPDES or PRETREATMENT MINOR (MI) \_\_\_\_

COMPLIANCE SCHEDULE YES X NO \_\_\_\_

POLLUTION PREVENTION \_\_\_\_ TREATMENT REQUIREMENT X

WATER QUALITY REQUIREMENT \_\_\_\_ OTHER \_\_\_\_

### OWNERSHIP CODE

Private \_\_\_\_ Federal \_\_\_\_ State \_\_\_\_ Municipal (town only) X Other public \_\_\_\_

DEEP STAFF ENGINEER Steve Muollo

DATE DRAFTED: March 6, 2015

### PERMIT FEES

Discharge Code	DSN Number	Annual Fee
111000e	001	\$2,682.50

### FOR NPDES DISCHARGES

Drainage Basin Code: 4500 Water Quality Classification Goal: B

Segment: Hockanum River 03

### NATURE OF BUSINESS GENERATING DISCHARGE

Municipal Sanitary Sewage Treatment

### PROCESS AND TREATMENT DESCRIPTION (by DSN)

Secondary Biological Treatment (activated sludge) with Nitrification and ultraviolet disinfection

### RESOURCES USED TO DRAFT PERMIT

X Federal Effluent Limitation Guideline 40CFR 133 Secondary Treatment Category

- ☐ Performance Standards
- ☐ Federal Development Document
 

name of category
- ☒ Department File Information
- ☒ Connecticut Water Quality Standards
- ☒ Anti-degradation Policy
- ☐ Coastal Management Consistency Review Form
- ☐ Other - Explain

#### **BASIS FOR LIMITATIONS, STANDARDS OR CONDITIONS**

- ☒ Secondary Treatment (Section 22a-430-4(r) of the Regulations of Connecticut State Agencies)
- ☒ Case-by-Case Determination (See Other Comments)
- ☒ In order to meet in-stream water quality (See General Comments)
- ☐ Anti-degradation policy

#### **GENERAL COMMENTS**

The Town of Manchester ("Manchester") operates a municipal water pollution control facility ("the facility") located at 120 Thrall Road, Manchester. The facility is designed to treat and discharge up to 8.2 million gallons a day of effluent into the Hockanum River. The facility currently uses secondary treatment with UV disinfection to treat effluent before being discharged. Pursuant to Conn. Gen. Stat. § 22a-430, the Department of Energy and Environmental Protection has issued Manchester a permit for the discharge from this facility. Manchester has submitted an application to renew its permit. The Department has made a tentative determination to approve Manchester's application and has prepared a draft permit consistent with that determination.

The most significant changes from the current permit are the inclusion of a compliance schedule in order to meet effluent phosphorus limits, revised bacteria monitoring requirements (e.g. e. coli), Aluminum monitoring to be consistent with the most recent CT Water Quality Standards and Iron monitoring to be consistent with EPA's National Recommended Water Quality Criteria.

#### **SPECIFIC REQUIREMENTS OR REVISIONS**

The Department reviewed the application for consistency with Connecticut's Water Quality Standards and determined that with the limits in the draft permit, including those discussed below, the draft permit is consistent with maintenance and protection of water quality in accordance with the Tier I Anti-degradation Evaluation and Implementation Review provisions of such Standards.

The need for inclusion of water quality based discharge limitations in this permit was evaluated consistent with Connecticut Water Quality Standards and criteria, pursuant to 40 CFR 122.44(d). Discharge monitoring data was evaluated for consistency with the available aquatic life criteria (acute and chronic) and human health (fish consumption only) criteria, considering the zone of influence allocated to the facility where appropriate. In addition to this review, the statistical procedures outlined in the EPA Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) were employed to calculate the need for such limits. Comparison of the attached monitoring data and its inherent variability with the calculated water quality based limits indicates a statistical probability of exceeding such limits. Therefore, water quality based limits for ammonia and zinc were included in the permit at this time.

A compliance schedule is included for the reduction of phosphorus in the effluent:

#### **Phosphorus Permitting Approach**

Phosphorus is a naturally occurring element that is essential to support plant growth. When present in excessive amounts, phosphorus can impair both aquatic life and recreational use of Connecticut's water resources. Excess

*nutrient enrichment is a serious threat to water quality in Connecticut. Excessive loading of phosphorus to surface waters as a result of discharges from wastewater treatment plants or non-point sources such as runoff from urban and agricultural lands, can lead to algal blooms, including blooms of noxious blue green algae, reduction in water clarity, and in extreme cases depletion of oxygen, fish kills, and other impairments to aquatic life. Currently, 21 water body segments have been identified on Connecticut's List of Waters Not Meeting Water Quality Standards where nutrient enrichment is a contributing cause of the impairment.*

*The Connecticut Water Quality Standards (WQS) do not include numeric criteria for nutrients but rather incorporate narrative standards and criteria for nutrients. These narrative policy statements direct the Connecticut Department of Environmental Protection to impose discharge limitations or other reasonable controls on point and non-point sources to support maintenance or attainment of designated uses. In the absence of numeric criteria for phosphorus, the Department has developed an interim nutrient management strategy for freshwater non-tidal streams based on the narrative policy statements in the WQS to meet the pressing need to issue NPDES permits and be protective of the environment. The strategy includes methods that focus on phosphorus because it is the primary limiting nutrient in freshwater systems. These methods were approved by the United States Environmental Protection (EPA) in their letter dated October 26, 2010 as an interim strategy to establish water quality based phosphorus limits in non-tidal freshwater for industrial and municipal water pollution control facilities (WPCFs) national pollutant discharge elimination system (NPDES) permits.*

*The method in the interim strategy uses best available science to identify phosphorus enrichment levels in waste receiving rivers and streams that adequately support aquatic life uses. The methodology focuses on algal communities as the key aquatic life nutrient response variable and phosphorus enrichment factors that represent significant changes in communities based on data collected statewide. Ongoing work is currently being conducted to refine the approach through additional data collection and by expanding the methodology to include non-waste receiving streams. It is expected that the ongoing work will lead to numeric nutrient criteria for all freshwater rivers and streams in the next WQS review cycle. The current approach provides for a major statewide advancement in the level of phosphorus control that is expected to meet all freshwater designated uses. The adaptive nature of Connecticut's strategy allows for revisions to permit limits in future permit cycles without delaying action that we know needs to be taken today.*

*The current approach follows a watershed based framework incorporating many of the elements from the U.S. EPA Watershed –Based National Pollutant Discharge Elimination System (NPDES) Permitting Technical Guidance (2007). Consistent with the 2007 Guidance, the approach “explicitly considers the impact of multiple pollutant sources and stressors, including nonpoint source contributions, when developing point source permits”. Expected current conditions are based on the probability of excess phosphorus export from land cover and municipal and industrial facilities in the upstream drainage basin. Connecticut's policy for phosphorus management is translated into a numeric expression through geo-spatial and statistical analyses that determines the maximum acceptable seasonal phosphorus mass load per unit area of watershed contributing flow to the point of assessment.*

*The goal of the interim strategy is to achieve or maintain an enrichment factor (EF) of 8.4 or below throughout a watershed. An EF is representative of the amount of anthropogenic phosphorus loading to river and streams. It is calculated by dividing the current total seasonal phosphorus load by a modeled total phosphorus load under complete forested conditions at a particular point along the river. An enrichment factor is representative of the amount of anthropogenic phosphorus loading to rivers and streams. The goal of an 8.4 enrichment factor represents a threshold at which a significant change is seen in the algal communities indicating highly enriched conditions and impacts to aquatic life uses.*

*The analysis was conducted using benthic algae collected in rivers and streams throughout CT under varying enrichment conditions. The approach targets the critical ‘growing’ season (April through October) when phosphorus is more likely to be taken up by sediment and biomass because of low flow and warmer conditions. During winter months aquatic plants are dormant and flows are higher providing constant flushing of phosphorus through aquatic systems with a less likely chance that it will settle out into the sediment. Limiting the phosphorus export from industrial and municipal facilities offers a targeted management strategy for achieving aquatic life designated uses within a waterbody. The export of some phosphorus from facilities and other land sources is considered normal use of the land recognizing that humans are part of the environment.*

*A seasonal load was established by the Department for each facility discharging to non-tidal waters based on the current degree of enrichment of the receiving water body at the point of discharge and the facilities contribution to the total watershed enrichment at the point of discharge.*

### **Manchester WPCF Permit Requirements**

A nutrient watershed analysis was conducted for the Hockanum River watershed below facilities discharging phosphorus into the river. The facilities discharging to the river include: Vernon WPCF and Manchester WPCF. The seasonal (April 1<sup>st</sup> through October 31<sup>st</sup>) nutrient loading from each facility discharging to the watershed was reduced to achieve an enrichment factor of 8.4 or lower throughout the river.

The current enrichment factor at the Manchester WPCF discharge is 42.4. The final proposed seasonal load allocation for Manchester WPCF is 13.21 lbs/day. This load equates to a proposed treatment performance limit of 0.25 mg/L multiplied by the current seasonal average flow of 6.33MGD. When this strategy is fully implemented by combining reductions at all facilities located in the same watershed, the NPDES load in the Hockanum River will be reduced by 90.86%.

Federal regulations at 40 CFR 122.44(d) indicate that permit issuers are required to determine whether a given point source discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard after consideration of existing controls on point and non-point sources of pollution. If a discharge is found to cause an excursion of a numeric or narrative state water quality criterion, NPDES regulations implementing section 301(b)(1)(C) of the Clean Water Act provide that a permit must contain effluent limits as necessary to achieve state water quality standards. The limit in the permit and the strategy are consistent with the narrative policy statements in the CT WQS and are expected to result in the attainment and maintenance of all designated uses for the water body when the strategy is fully implemented. If the Department develops numeric criteria in the future, or it is found that the current limit under the strategy is not sufficient to achieve designated uses, the goal will be modified and the WPCF will be expected to meet the more stringent water quality goal.

Translating the average performance level of 13.21 lbs/day into enforceable permit limits requires consideration of effluent variability and frequency of monitoring in order to comply with federal permitting regulations. The procedure used is as follows:

1. Consider the permit performance level (0.25 mg/L) to be equivalent to the Long Term Average (LTA)
2. Calculate the Maximum Daily Limit by multiplying the LTA by the 99th percentile LTA Multiplier appearing in Table 5-2 of the Technical Support Document (page 103 of EPA/505/2-90-001) corresponding to a CV of 0.6% to account for effluent variability:

Maximum Daily Limit:  $0.25 \text{ mg/L} * 3.11 = 0.78 \text{ mg/L}$

3. Calculate the Average Monthly Limit by multiplying the LTA by the 95th percentile LTA Multiplier appearing in Table 5-2 of the Technical Support Document corresponding to a CV of 0.6% to account for effluent variability and either n=4 samples/month or n=10 samples/month as appropriate for the facility to account for the precision of estimating the true monthly average based on an average for the days the effluent was sampled:

Average Monthly Limit =  $0.25 \text{ mg/l} * 1.55 = 0.39 \text{ mg/l}$

#### Summary of Limits for Manchester WPCF:

**Average Daily Load = 13.21 lbs/day**

**Total Seasonal Load = (13.21 lbs/day \* 214 Days/Season) = 2827 lbs/season**

**Maximum Daily Limit = 0.78 mg/L**

**Average Monthly Limit = 0.39 mg/L**

With respect to the foregoing summary of limits, it should be noted that compliance with the Maximum Daily Limit or the Average Monthly Limit during the time the seasonal load limit is calculated will not ensure compliance with the Total Seasonal Load limit. For example, if the Permittee discharged phosphorus at the maximum permitted by either the Maximum Daily Limit or the Average Monthly Limit throughout the time that the seasonal load is calculated, the Permittee would exceed the Total Seasonal Load limit. For this reason, the Permittee must monitor compliance with the Total Seasonal Load limit independent of its compliance with the Maximum Daily Limit and the Average Monthly Limit.

### **WATER QUALITY LIMIT CALCULATIONS**

*The permit reissuance includes seasonal ammonia limits in this permit that were in the previous permit and were the result of the WLA for the Hockanum River for ammonia toxicity.*

*The zinc limits in the permit were the result of a successful zinc reduction program and 5 years of in-stream monitoring that shows no negative in-stream water quality impacts. The weekly in-stream monitoring program will not be continued in this permit.*

*Based on the most recent years of monitoring data (2010-2014, 260 samples), the Department concluded that no reasonable potential exists to cause or contribute to an exceedance of the water quality criteria for copper in the Hockanum River as a result of the discharge, provided these low levels are maintained. Therefore no limit on total copper was included in the permit.*

*The facility is nearing completion of an upgrade that will enable advanced treatment including nitrogen removal and phosphorus removal.*

*See attached*